



Newsletter for March 2023

Eye Project

Introduction

By Coltyn | March 29, 2023

Hi everyone, Coltyn here, introducing the eye project to the Freedom of Form community! I was introduced in the January 2023 newsletter and I am here this month to give a sneak peek at what I am working on with the research team. As highlighted in January, I am an eye biologist by training and am excited to be putting my professional scientific knowledge and expertise to work for FFF.

Generally speaking, the eye is a complex organ with various anatomical and physiological features that determine its function. Luckily enough, the groundwork for the gross anatomy, cellular relationships, gene networks, etc in the eye has more or less been elucidated. It is then my job to take that basic biology knowledge and apply it to how we can customize the eye to the desired state by the client. Therefore, my objective is to research and develop strategies to biologically customize the eyes as safely and efficiently as possible.

While there are various anatomical sections of the eye, I will be focused primarily on what is called the anterior segment. The anterior segment of the human eye is a complex system that includes several important structures such as the pupil, iris, eyelid, sclera, and eyeball size. By researching each of these structures, I aim to understand how we can best mimic their features to match Fursona characteristics as desired by the client. To achieve this, I am dedicated to providing proof of concept and theoretical

concepts for experimental purposes, guiding researchers through the next steps such as identifying model systems at both the in vitro and in vivo levels to develop viable customization options for our clients.

In general, the modification of eye anatomy for aesthetic purposes requires a deep understanding of the complex anatomy and physiology of the eye. Changes to the pupil's shape and size can have significant impacts on situational awareness and visual acuity. Iris color can be altered through genetic modification of melanization genes, while changes to eyelid shape will likely require surgical customization. Sclera color changes through tattooing carry significant risks, making gene editing of connective tissue fibroblasts a more promising approach. Modification of eyeball size requires restructuring of the skull and optic nerve elongation, but presents an opportunity to introduce new color opsins to the retina since we will be altering optic nerve growth which is just an elongated retina sending signals to the brain. Ultimately, any modification of eye anatomy for aesthetic purposes requires a balance between achieving the desired effect and minimizing risk for the client.

If this is something that you are excited about and would like to assist me in this research project then send an email to me at chris.devera@freedomofform.org and we can start a conversation! I am looking for anyone who has a background in cellular and molecular biology, genetics, and neuroscience. If this sounds like you then send an email my way! You don't need to have any knowledge of the eye, that can be taught by yours truly 😊.

Volunteer Spotlight:

Lathreas

By Lathreas | March 30, 2023



Hello! My name is Lathreas, CTO of the Freedom of Form Foundation and project lead of the Anatomy Reengineering Framework. I have joined the FFF in 2020, and I hope to contribute to this endeavor for many more years to come. But my dream and resolve to contribute in this area started much earlier. Ever since I was small, I dreamed of the possibility of becoming a different species, something with scales and a snake-like snout, an elegant body that can swim in waters or fly in the skies. Although giving a human functioning wings may turn out to be practically difficult to achieve in a reasonable timeframe, science would surely be able to help with smaller things, like growing a snout, a tail, or scales or fur. But to my dismay, no organized research efforts were underway whatsoever — none that I could find at least — even though science and bioengineering had made such great strides in the recent past.

As such, it was in 2014 that I decided to commit to the path of research and engineering myself to make this dream a reality. To start, I did what I could do at the

time: to continuously develop increasingly anatomically feasible 3D reference models of finalized transformations, to explore the possibilities of nanobiology, and to develop plans of attack. My aim was to search for, join, or assemble a team of bioengineers around 2020, to ensure that we can get full speed ahead at that key point in time. To my pleasant surprise, I found out about the existence of the Freedom of Form Foundation at the end of 2019, and I cautiously followed the organization's steps to see if this would really be the group I had been waiting for. I joined the group in 2020, volunteering for the then-named 3D anatomy project, which now has turned into the Anatomy Reengineering Framework project. Since then, the organization has grown so much, both in size and in professionalism, and I have grown too because of it. I firmly believe that this group has the drive necessary to see this through.

As a nanobiologist, I am positioned at the intersection of various disciplines. As such, I have been putting my skills to use where I think they are the most useful to get us toward our final goal. At a high level, I have been contributing mostly towards keeping ourselves engineering-oriented, even if that is bioengineering, to ensure that everything comes together within the next few decades. But I am also involved in many low-level tasks, such as dry-lab modeling, programming systems for the Anatomy Reengineering Framework, doing research for the Integument Review Project, and generally helping out wherever I can. I try to focus mostly on topics where I can complement the team, such as by studying biomaterial engineering within the integument, visual properties of fur, scales, and feathers modeled with light transport, broad designs of genetic circuits, and much more. And as we grow, as CTO, I am hard at work to ensure we keep the big picture in mind, so that with every short-term engineering step that we take, we move decisively in the right direction.

Now for some more personal stuff! What would I like to be after this is all completed? My desired species is a mixture of various

animals, which I think together would be best described as a dragon, and an aquatic one at that. I would have green scales, with a snake-like overlap in them. Whenever I have free time, I spend time working on my 3D models to see if I can tweak it just a little bit more to make it closer to what I would like to become. But I am restricting myself in how much artistic freedom I can take with the model, because I want to make sure that what I design is actually feasible in real life so as not to give me any false hope. If I could have anything I wanted, all I would really want is to just *exist* as my true self. And I am excited to move toward that point together, with all of you who are working in some fashion on a full body alteration, both within and outside of the FFF.

I am very happy to have found the Freedom of Form Foundation and to be working with such excellent people. After all, collaboration gets us so much further, and that shows by just how much we have managed to achieve together already. Not to mention how the lasting friendships found here lead to a powerful boost in my own motivation to work towards this goal. Of course, our work is only just beginning, and we have a long way to go. I am looking forward to seeing what we can achieve together with hard work and continuous effort. This is a dream worth making a reality, for ourselves and so many others too.

New research volunteer openings!

By Zennith | March 31, 2023

Our Integument Review, Anatomy Re-engineering Framework, Enhanced Tail, and other projects are moving along. But, as you can imagine, we have many more technical challenges between where we're at today, and where our goals are with ~~making furries IRL~~ embracing identity affirmation procedures.

We have to be working on more projects in parallel. For example, there's no way around the fact that no matter how much work you get done with research in fur, scales, and feathers, you're not solving challenges in the musculoskeletal system!

To address this, we're opening several new volunteer openings for independent research projects. These include:

- (1) developing a kinetic computer model of digitigrade stance,
- (2) develop a computer model of how scales or feathers bend when force is applied,
- (3) modeling to help us figure out how to make sure anthros with fur coats don't overheat, and
- (4) review biology of the muscular or skeletal system, and propose how to change them using current and near-future techniques.

1 through 3 are fairly defined projects with knowable outcomes, and 4 is more of a summarize-and-hypothesize project.

You don't have to have a PhD, or even have completed a bachelor's, as long as you've had some college-level instruction and independent work or research experience. Lathreas, Tiltwolf, myself, and others in our organization are very happy to advise and mentor you, as long as you have the energy to push hard. These are thrilling projects and I'm excited for whoever gets to take them on!

Please check out the positions at <https://freedomofform.org/involvement/volunteer/> - they're the first ones in the list. If you think any of your friends would be interested, please let them know as well. Thanks so much!

PS - remember, these volunteer openings are ultimately just proposals. If you have a different idea, just reach out and we can potentially figure out something. There's many more things on our radar than we included in the volunteer postings, and there's a solid chance we'll be interested in other proposals.